> appears from recent observations to be derived from the activities of small dense unnamed granules which in a few normal cells can be seen in what appears to be the act of division. (p. 88)

The following year (1946–7) Porter said of the endoplasm that

> the evidence is convincing that it is the most active part of the living unit. It is present in one form or another in every cell so far examined. It makes up a fibrillar apparatus concentrated around the central body and sends fine extensions of its substance throughout the cell. The vesicular structure of the small units suggests a secretory activity. In as much as it is the only cytoplasmic system showing some structure and continuity, it may be assumed that it determines the mosaic character of the egg cell. (p. 80)

Porter also engaged in his own studies of cancer cells. In his first efforts he, together with visiting fellow Helen Thompson, examined cultured cells from three different rat sarcomas (the *Annual Report* for 1946–7 indicates four sarcomas). These cells, they claimed, exhibited a much greater density of endoplasmic granules located on shorter strands (Porter & Thompson, 1947). A second study involved mammary carcinoma in mice. John Bittner (1936) had discovered that this cancer was transmitted through their mother's milk. With Thompson, Porter used the electron microscope to examine mammary gland tumor cells grown in tissue culture from mice. They identified within them distinctive particles about 130 m μ in diameter with a dark, well-defined central core. Although the evidence was only circumstantial, they proposed "tentatively" that the particles were the viral agent in the milk (Porter & Thompson, 1948).

## 7. THE STATE OF CELL STUDIES AT THE END OF THE 1940s

As I will discuss at the beginning of the next chapter, in 1949 and 1950 the research laboratory at Rockefeller underwent a major transformation and the research efforts broadened to other laboratories. So we reach a natural transition and it is worth drawing together just what was accomplished during the 1940s in that laboratory (see Claude, 1950, for a useful recapitulation). The decade began with Claude's determination that normal cells contained particles of the same size as he had isolated in his tumor-causing fraction from Rous sarcoma cells. His research increasingly focused on the constitution of normal cells (although he would return to the attempt to identify cancer particles later in the decade). Initially cell fractionation was his primary tool, and with it, he developed standardized procedures to segregate